Curriculum Vitæ of Filipe Moura

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Full name: Filipe Alexandre Pedra Aguiar de Moura

Birthdate: November $7^{\underline{\text{th}}}$, 1974

Birthplace: Lisbon, Portugal

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Nationality: Portuguese

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Education:

- Bachelor in Technological Engineering Physics from Instituto Superior Técnico (Technical University of Lisbon) in July 1997 with distinction and a final grade point average of 18.4 out of 20. Undergraduate thesis on *Theory and Implications of Neutrino Mass* supervised by Prof. Jorge Crispim Romão.
- Ph.D. in Physics, State University of New York at Stony Brook, August 2003. Ph.D. advisor: Prof. Martin Roček. Thesis: *String Corrections to Supergravity Theories*.

Current professional and scientific situation: Postdoctoral researcher at the Department of Mathematics of Instituto Superior Técnico. Member of the Security and Quantum Information Group of Instituto de Telecomunicações.

Professional and teaching experience:

- 07/06 - 09/06: Internship as a scientific journalist in the portuguese newspaper PÚBLICO.
- 10/05 - 06/06: Visiting researcher at the Instituut voor Theoretische Fysica, Universiteit van Amsterdam, The Netherlands.
- 01/04 - 09/05: Post-doctoral researcher at Centre de Physique Théorique, École Polytechnique, Palaiseau, France, and at Service de Physique Théorique, Commissariat à l'Énergie Atomique, Saclay, France.
- 10/03 - 12/03: Post-doctoral researcher at the Department of Mathematics of Instituto Superior Técnico.

- 06/03 - 08/03: Teaching assistant at the Department of Physics and Astronomy of the State University of New York at Stony Brook.
- 09/02 - 05/03: Teaching assistant at the Department of Mathematics of the State University of New York at Stony Brook.
- 06/02 - 08/02: Teaching assistant at the Department of Physics and Astronomy of the State University of New York at Stony Brook.
- 08/01 - 05/02: Research assistant at the C. N. Yang Institute for Theoretical Physics of the State University of New York at Stony Brook.
- 01/98 - 05/98: Teaching assistant at the Department of Mathematics of the State University of New York at Stony Brook.
- 09/95 - 07/97: Undergraduate teaching assistant at the Department of Mathematics of Instituto Superior Técnico.

Other scientific activities:

- Scientific referee of the journal *Classical and Quantum Gravity.*
- Member of the project *Quantum Security* (`http://sqig.math.ist.utl.pt/QSEC/`), approved by Fundação para a Ciência e a Tecnologia (Portugal), under coordination de Paulo Mateus. Responsible for the task *Quantum cryptoanalysis and computation.*
- Member of the editorial board of the journal *Gazeta de Física*, published by the Portuguese Physical Society.

Knowledge of Languages:

- Portuguese: mother tongue.
- English: oral comprehension - very good; reading - very good; writing - very good; scientific writing - very good; speaking - very good.
- French: oral comprehension - good; reading - very good; writing - very good; scientific writing - very good; speaking - good.
- Spanish: oral comprehension - good; reading - very good; writing - reasonable; scientific writing - reasonable; speaking - good.

Computing abilities: Good knowledge of *Windows*; production of every kind of documents in LaTeX and html; programming in *Mathematica*.

Fields of expertise: Theoretical and Mathematical Physics: Supersymmetry, Supergravity and Quantum Field Theory. Information theory. Quantum Computation.

Current research interests: Black holes and quantum information theory. Topological and adiabatic quantum computation. Quantum security and cryptography.

Publication list:

- Doctoral thesis: *String Corrections to Supergravity Theories*, State University of New York at Stony Brook, August 2003.
- Articles in refereed international journals:
  1. F. Moura: *Type II and heterotic one loop string effective actions in four dimensions*, *J. High Energy Phys.* **06** (2007), 052, `arXiv:hep-th/0703026`;
  2. F. Moura and R. Schiappa: *Higher Derivative Corrected Black Holes: Perturbative Stability and Absorption Cross-Section in Heterotic String Theory*, *Class. Quant. Grav.* **24** (2007), 361, `arXiv:hep-th/0605001`;
  3. F. Moura: *Four dimensional "old minimal" $\mathcal{N}=2$ supersymmetrization of $\mathcal{R}^4$*, *J. High Energy Phys.* **07** (2003), 057, `arXiv:hep-th/0212271`;
  4. F. Moura: *Four dimensional $\mathcal{R}^4$ superinvariants through gauge completion*, *J. High Energy Phys.* **08** (2002), 038, `arXiv:hep-th/0206119`;
  5. F. Moura: *Four dimensional $\mathcal{N}=1$ supersymmetrization of $\mathcal{R}^4$ in superspace*, *J. High Energy Phys.* **09** (2001), 026, `arXiv:hep-th/0106023`.
- Conference proceedings:
  1. P. Mateus, F. Moura and J. Rasga: *Transferring Proofs of Zero-Knowledge Systems with Quantum Correlations* in *Proceedings of the First Workshop on Quantum Security: QSec'07* (2007), 9, IEEE Press;
  2. F. Moura: *Perturbation theory and stability analysis for string-corrected black holes in arbitrary dimensions*, XXVIII Spanish Relativity Meeting - A Century of Relativity Physics, *AIP Conf. Proc.* **841** (2006), 542, `arXiv:hep-th/0608009`;
  3. F. Moura: *Superspace supergravity and supersymmetrization of $\mathcal{R}^4$*, *Publicaciones de la Real Sociedad Matemática Española* **7** (2004), 173-180;
  4. F. Moura: *Four dimensional supersymmetrization of $\mathcal{R}^4$* in *Boston 2003, 20 years of SUGRA* (2004), 279-283, Rincon Press, `arXiv:hep-th/0306285`.
- Submitted articles:
  1. F. Moura: *Perturbative stability and absorption cross section in string corrected black holes*, `arXiv:gr-qc/0701007`;
  2. F. Moura: *One loop superstring effective actions and $\mathcal{N}=8$ supergravity*, submitted to *Physical Review D*, `arXiv:0708.3097[hep-th]`;
  3. F. Moura: *One loop superstring effective actions and $d=4$ supergravity*, `arXiv:0711.3228[hep-th]`;
  4. F. Moura: *Four dimensional $\mathcal{R}^4$ superinvariants*, invited review article to appear in the volume *Lecture Notes in Physics for SAM2007 - School on Attractor Mechanism*, to be published by Springer-Verlag.
- Articles in preparation:
  1. F. Moura: *Dilatonic d–Dimensional Black holes in Heterotic String Theory: Perturbative Stability and Absorption Cross-Section*;
  2. F. Moura: *Higher Derivative Corrections to Extremal Black Holes in $\mathcal{N}=1$ Supergravity.*

Fellowships:

- Post-doctoral fellowship from the Portuguese Science and Technology Foundation (Fundação para a Ciência e a Tecnologia) (since 2005).
- Media fellowship for communication of science (2006).
- Post-doctoral fellowship from ÉGIDE (Centre français pour l'accueil et les échanges internationaux) (2004).
- Doctoral fellowship from the Portuguese Science and Technology Foundation (Fundação para a Ciência e a Tecnologia) (1997-2001).
- Pre-doctoral fellowship from the High Energy Theory Group of Instituto Superior Técnico (1996).

Prizes:

- T. A. Pond prize from the Department of Physics and Astronomy of State University of New York at Stony Brook for the highest performance on the Ph.D. written comprehensive examination in 1997/98.

Expository seminars and lectures:

- *Anomalies in string theory*, YITP informal seminar, State University of New York, Stony Brook, December 2000.
- *Anomalies in type IIB supergravity and in type I supergravity coupled to SYM*, YITP informal seminar, State University of New York, Stony Brook, October 2000.
- *Eleven and ten dimensional supergravities*, YITP informal seminar, State University of New York, Stony Brook, September 2000.
- *Supergravity coupled to matter, super Higgs mechanism and SUGRA-mediated SUSY breaking*, YITP informal seminar, State University of New York, Stony Brook, April 1999.
- *Simple supergravity in superspace*, YITP informal seminar, State University of New York, Stony Brook, March 1999.
- *Simple supergravity in x space*, YITP informal seminar, State University of New York, Stony Brook, March 1999.

Research seminars:

- *Buracos negros e informação quântica* (in portuguese)
  1. Instituto Superior Técnico (11th Physics Week), Lisbon, Portugal, November 2007.
- *Type II and heterotic one loop effective actions in four dimensions*
  1. Instituto Superior Técnico, Lisbon, Portugal, September 2007;
  2. INFN-Laboratori Nazionali di Frascati, Italy, June 2007;
  3. University of Porto, Portugal, July 2006.

- *Perturbative stability and gravitational wave scattering for string-corrected black holes in arbitrary dimensions*
  1. Freie Universität Berlin, Germany, July 2006;
  2. Instituut voor Theoretische Fysica, Universiteit van Amsterdam, The Netherlands, June 2006;
  3. LPT, Université de Paris-Sud XI (Orsay), France, June 2006;
  4. LPTHE, Université Pierre et Marie Curie (Paris VI - Jussieu), France, May 2006;
  5. University of Oviedo, Spain, September 2005.
- *Teorias de Supercordas e Suas Acções Efectivas* (in portuguese)
  1. University of the Algarve, Portugal, September 2005.
- *Econofísica: pode a Física contribuir para o avanço da Economia enquanto Ciência?* (in portuguese)
  1. Instituto Superior de Economia e Gestão, Lisbon, Portugal, June 2005.
- *String Corrections to Supergravity Theories*
  1. State University of New York, Stony Brook, USA (thesis defense), June 2003.
- *Four dimensional supersymmetrization of* $\mathcal{R}^4$
  1. École Polytechnique, France, February 2004;
  2. University of Coimbra, Portugal, September 2003;
  3. Northeastern University, Boston, USA, March 2003;
  4. University of Bologna, Italy, January 2003;
  5. Faculdade de Engenharia, Universidade Católica Portuguesa, December 2002;
  6. State University of New York, Stony Brook, USA, December 2002.
- *Superspace supersymmetrization of higher derivative actions*
  1. Instituto Superior Técnico, Lisbon, December 2001;
  2. University of Colorado at Boulder (Theoretical Advanced Study Institute), USA, June 2001.

Most relevant schools and conferences:

- 2007
  1. *XVI Fall Workshop on Geometry and Physics*, Instituto Superior Técnico, Lisbon, Portugal;
  2. *Quantum Computation and Topological Orders*, El Escorial Summer School, Spain;
  3. *SAM2007 - School on Attractor Mechanism*, INFN-Laboratori Nazionali di Frascati, Italy.
- 2006
  1. *30 Years of Supergravity*, Institut Henri Poincaré, Paris, France;
  2. *Eleventh Marcel Grossmann Meeting on General Relativity*, Freie Universität Berlin, Germany;
  3. *XV Oporto Meeting on Geometry, Topology and Physics*, University of Porto, Portugal;

4. *RTN Winter School on Strings, Supergravity and Gauge Theory*, CERN, Geneve, Switzerland.

- 2005
  1. *XXVIII Spanish Relativity Meeting - "A Century of Relativity Physics"*, Oviedo, Spain;
  2. *XIV Oporto Meeting on Geometry, Topology and Physics*, University of Porto, Portugal;
  3. *Dixièmes Rencontres Claude Itzykson: Quantum Field Theory Then and Now*, CEA, Saclay, France;
  4. *"Physics for Tomorrow": Launch Conference of the International Year of Physics*, UNESCO, Paris, France.
- 2004
  1. *2004 Workshop on Algebraic Geometry and Physics*, Instituto Superior Técnico, Lisbon, Portugal;
  2. *Strings 2004*, Collège de France, Paris, France;
  3. *Modern Trends In String Theory 2*, University of Porto, Portugal.
- 2003
  1. *XII Fall Workshop on Geometry and Physics*, University of Coimbra, Portugal;
  2. *20 Years of SUGRA and Search for SUSY and Unification (SUGRA20)*, Northeastern University, Boston, USA;
  3. *RTN Winter School on Strings, Supergravity and Gauge Theory*, Torino, Italy.
- 2002
  1. *Continuous Advances in QCD 2002*, Theoretical Physics Institute, University of Minnesota, Minneapolis, USA;
  2. European Winter School RTN 2002 *The quantum structure of spacetime and the geometric nature of fundamental interactions*, University of Utrecht, The Netherlands.
- 2001
  1. *Supergravity at 25*, C.N. Yang Institute for Theoretical Physics, State University of New York, Stony Brook, USA;
  2. *Modern Trends In String Theory*, Instituto Superior Técnico, Lisbon, Portugal;
  3. *Theoretical Advanced Study Institute TASI 2001 - Strings, Branes and Extra Dimensions*, University of Colorado at Boulder, USA;
- 2000
  1. *NATO Advanced Study Institute 2000 - Recent Developments in Particle Physics and Cosmology*, Cascais, Portugal.
- 1999
  1. *Advanced School on Supersymmetry in the Theories of Fields, Strings and Branes*, University of Santiago de Compostela, Spain.
- 1999, 1998, 1997
  1. *Oporto Meetings on Geometry, Topology and Physics*, University of Porto, Portugal.

- 1998, 1996
  1. *International Workshop on New Worlds in Astroparticle Physics*, University of the Algarve, Faro, Portugal.

Other research projects: Project in holography at the Instituto Superior Técnico Lasers and Plasmas Group laboratory (1993).

Other activities:

- Responsible for the informal scientific revision of the portuguese translation of the book *Equations - Icons of Knowledge* by Sander Bais.
- Elected member of the Board of Auditors of the Instituto Superior Técnico Students' Union in 1995/96.
- Elected representative of the students of Technological Engineering Physics in the Pedagogical Council of Instituto Superior Técnico in 1995 and 1996.
- Member of the Organizing Commitee of the Congress *Avaliação no IST* (Instituto Superior Técnico, January 1996).
- Member of NFIST (Instituto Superior Técnico Physics Club), and of PULSAR, a Physics students' journal, between 1995 and 1997.
- Assistant collaborator in the organization of the First Instituto Superior Técnico Physics Week (October 1996).

References:

- Martin Roček, Professor, C.N. Yang Institute for Theoretical Physics, State University of New York at Stony Brook;
- Peter van Nieuwenhuizen, Professor, C.N. Yang Institute for Theoretical Physics, State University of New York at Stony Brook;
- Jacobus Verbaarschot, Professor, Department of Physics and Astronomy, State University of New York at Stony Brook;
- Pierre Vanhove, Permanent Tenured Researcher, Commissariat à l'Énergie Atomique (Service de Physique Théorique), Saclay, France;
- Carlos Rocha, Professor, Instituto Superior Técnico, Department of Mathematics;
- José Cidade Mourão, Associate Professor, Instituto Superior Técnico, Department of Mathematics;
- Jorge Dias de Deus, Professor, Instituto Superior Técnico, Departament of Physics.